12-14-80

OWNERS MANUAL

Bearcat® 220

20 Channel Crystalless Scanner

Aircraft • Marine • Public Service

MONITORS VHF and UHF FM RADIO SERVICES

Hams	Utility Services	Special Emergency
Police	Industry	Disaster Relief
Government	Business	School Buses
Forestry	Hospitals	Transportation
Conservation	Ambulances	Taxicabs
Mobile Telephones	Automobile Emergency	Railroads
Press	Marine	Paging
Fire	Manufacturers	Trucks
Aircraft		

MADE IN CUMBERLAND, IND. U.S.A. UNDER ONE OR MORE OF THE FOLLOWING PATENTS
3,961,261 3,962,644 4,027,251 4,092,594 4,100,497 4,123,715
and patents pending

Electra ELECTRA COMPANY

DIVISION OF MASCO CORPORATION OF INDIANA
CUMBERLAND, INDIANA 46229

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TABLE OF CONTENTS

Radio Services ..... Front Cover

Table of Contents 1
Technical Specifications 2
Safety Precautions 2
General Description 3
Operating Instructions 3
Front Panel Controls 3
Keyboard 4
Display Features 5
Programming Frequencies 5
Direct Channel Access 6
Scanning 6
Priority 7
Lockout 7
Speed 7
Delay 7
Search 8
Aircraft/Marine Search 8
External Antenna 9
External Speaker 9
Battery/Installation 9
Mobile Installation 10
User Hints 10
Service 11
Birdies 11
Frequency Allocations 12-14

Warranty ..... Back Cover

UL® UNDERWRITERS LABORATORIES LISTED

Certified in accordance with FCC Rules and Regulations Part 15.63 as of date of manufacture.

CAUTION

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

For future reference, write the model number and serial number below. You will find them printed on the back of your radio.

Model No._____ Serial No._____

Purchased from: _____ Date _____

OVER

1	LOGAN CO. FIRE	154.355-154.355-192.8
2	INDIAN LAKE EMS	154.295-154.295-192.8
3	FIRE DEPT. FIRE	154.570-154.570 NT
4	VILLAGE LAKEVIEW	154.115-154.115-NT
5	STATE WIDE FIRE	154.280-154.280 NT
6	EMA	155.805-155.805 NT
7	AUGLAZE FIRE	154.370-154.370 NT
8	HARDIN COUNTY FIRE	154.160-154.160 NT
9	STATE PARK	151.355-151.355 NT
10	LOGAN COUNTY	155.700-155.770 1928

11- ROBINAUGH-155.265- 155.265 NT
12-

CONSIDER THE "RELM" OF POSSIBILITIES....

UHF SYNTHESIZED DESKTOP

REPEATERS (DRU) AND BASE STATIONS (DBU)

DRU FEATURES:

- 16 User Decode/Encode CTCSS/DCS Codes
- 104 DCS and 50 CTCSS Codes
- 25 Watt Standard (10 Watt Continuous)
- Low Power Per Channel (Tuneable to 2 Watts)
- CWID Identifier (8 Digit)
- Courtesy Beep Per User
- Repeat Enable/Disable
- 120/240 VAC 50/60 Hz Selectable
- Local Monitor Enable/Disable
- Internal Speaker
- Remote Option Enable/Disable
- Busy Channel Lockout
- Local Control
- Programmable TOT and Hang Time

DRU OPTIONS:

Internal Duplexer • Base Station Microphone • Handheld Microphone • 45 Watt Amplifier

DBU FEATURES:

- 16 Channel Base Station
- 25 Watt Standard (10 Watt Continuous)
- Low Power Per Channel (Tuneable to 2 Watts)
- 50 CTCSS Encode/Decode Per Channel
- 104 DCS Standard/Inverted Per Channel
- Off Hook Scan
- 120/240 VAC 50/60 Hz Selectable
- Scan & Priority Scan
- Scan/Priority Delay
- Talk Around
- Internal Speaker
- Remote OpEnable/Disable
- Busy Channel Lockout
- DTMF ANI Per Channel (4 digit)

DBU OPTIONS:

Base Station Microphone • Handheld Microphone • 45 Watt Amplifier

CONTACT YOUR SALES REPRESENTATIVE AT

C G MARKETING, INC.

TEL: (216) 285-9071 FAX: (216) 285-7514

TECHNICAL SPECIFICATIONS*

Size:	10 5/8" W x 3 ½" H x 8" D
Weight:	5 lbs.
Cabinet:	Embossed Steel
Power:	117 Vac, 20W; 13.8 Vdc, 9W
Antenna:	Telescoping antenna (supplied) Connector provided for external antenna (50-70 ohms)
RF Sensitivity:	0.4uV 32-50MHz 0.4uV 144-174MHz 0.8uV 420-512MHz (±5KHz deviation 12db SINAD) 1.0uV for 10db S/N Aircraft 60% mod.
IF Selectivity:	-55db @ ±25kHz
Frequency Coverage:	Low Band 32-50MHz Aircraft 118-136MHz Amateur 144-148MHz High Band 148-174MHz UHF Band 420.450-470MHz UHF-T Band 470.0125-512.45MHz
Scan/Search Speed:	Selectable 4 or 11 channels per second
Audio Output:	2 Watts RMS, 8 ohms, 10% THD (max.)
Front Panel:	Volume (ON/OFF) Squelch (Auto. Squelch) Display Keyboard Speaker
Rear Apron Connectors:	12Vdc External Antenna External Speaker Jack 117Vac Receptacle Ground Terminal

***Specifications are typical and subject to change without notice.**

SAFETY PRECAUTIONS

Although your Bearcat 220 is listed with Underwriters Laboratories for complying with standards of safety, a review of common precautions is recommended.

- Do not operate this unit if it is wet.
- Never touch an electrical appliance while standing in water or on wet ground.
- Do not tamper with the internal circuitry.
- Do not connect or disconnect the rear-apron power connector when the line cord is plugged in to an ac receptacle.

GENERAL DESCRIPTION

The Bearcat 220 uses a microprocessor to make scanning easy. Its versatile keyboard is divided into a Program Section that will allow you to command any frequencies (VHF/UHF) on its 20 channels; and an Operation Section that controls scan, lockout of unwanted channels, direct channel access, service search, selectable speed control for both scan and search, priority and programmed search.

The solid state circuits include 3 custom designed integrated circuits that give it unique features. It operates on either 117Vac or 12Vdc.

OPERATING INSTRUCTIONS

Read the following instructions carefully and enjoy listening to your scanner in minutes.

1. Unpack the unit from the carton (save the carton for possible future use). Check your scanner for shipping damage; if damage has occurred, contact your dealer immediately.
2. Install two AA batteries. See picture on bottom of radio or battery details page 9.
3. Attach the power cord to the radio and then into a 117Vac outlet.
4. Insert the threaded end of the antenna into the hole on the top of the scanner. Screw it finger-tight and extend it fully.
5. Turn your scanner ON by turning the volume control clockwise 1/3 of its rotation.
6. Rotate the squelch control clockwise until you hear background noise; then turn it back counterclockwise until the noise disappears.
7. You are ready to program frequencies in your scanner. It is **scanning** at **fast speed** as indicated by the rolling display.

FRONT PANEL CONTROLS

1. ON/OFF-VOLUME: Turns the receiver ON and OFF and adjust the sound level.
2. SQUELCH: Allows the radio to scan or search for signals, and keeps radio quiet unless a signal is being received.
3. AUTO SQUELCH: A convenient, fixed squelch setting.
4. KEYBOARD: Simply punch in the desired frequencies you wish to monitor. It also controls automatic scan or manual channel select, bank select, service search, search limits, starts or holds the radio searching, programs the delay and lockout features into any desired channel.

KEYBOARD

PROGRAM KEYS:

Numeric keys [0] thru [9] and decimal point [.] are used to program the frequencies into your scanner. [E] enters frequencies into scan channels from keyboard or from search display.

OPERATION KEYS:

[Scan] Starts scan of all displayed channels.

[Manual] Stops scan; single steps your scanner through all 20 channels.

[Lockout] Locks out displayed channel during scan only.

[Delay] Delays 1 second to receive a reply transmission when on the same channel.

[Search] Starts searching for signals between two selected frequencies. Restarts after "hold".

[Limit/Hold] Enters two selected frequencies as upper and lower limits; also stops search.

[Speed] Selects scan or search rates of 4 or 11 channels per second.

[Priority] Samples channel 1 every two seconds and automatically switches to any signal on channel 1 regardless of any other signals.

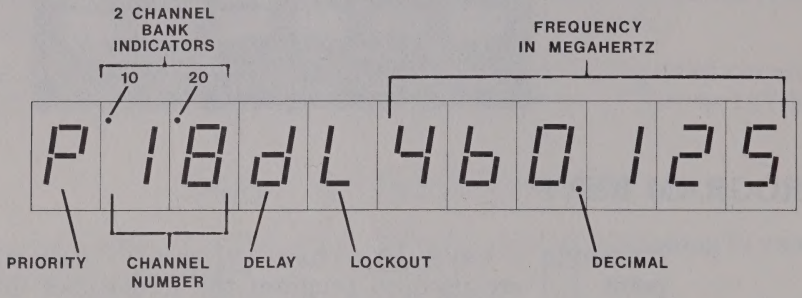
[Aircraft] Provides a single key-press Search of the entire Aircraft Band (118-136MHz). "Image" interference from non-aircraft signals may be received in this mode. See page 8 for explanation and suggestions.

[Marine] Searches the marine band (156.05-157.480, 160.625-162.025 MHz).

[10] [20] Two banks (10 channels each) are each included or excluded.

DISPLAY FEATURES

The display consists of 11 spaces or "windows" in which lighted characters indicate the programming commands of the keyboard and scanning status.



PRIORITY is selected in first space.

CHANNEL 18 is selected in second and third space.

BOTH CHANNEL BANKS, 10 and 20, are selected as indicated by dots at upper left of second and third spaces.

DELAY selected in fourth space.

LOCKOUT selected in fifth space.

AIRCRAFT selected in fifth space. [a]

MARINE selected in fifth space. [-]

FREQUENCY 460.125MHz is selected (6th thru 11th spaces) and programmed in channel 18.

PROGRAMMING FREQUENCIES INTO THE RECEIVER

You can program your radio to scan twenty different frequencies, one in each of the twenty channels. (De-select priority.)

EXAMPLES

To program 162.55MHz in desired channel (for example channel 14):

PRESS:	[Manual]	step to desired channel (14)
PRESS:	[1] [6] [2] [.] [5] [5] [E]	
READ:	1 4	162.550
PRESS:	[Manual]	steps for next channel (15)

To program 471.1375MHz in next channel (for example channel 15):

PRESS:	[4] [7] [1] [.] [1] [3] [7] [5] [E]
READ:	1 5 471.137 (rounded off to 6 places)

If you attempt to program a frequency that is outside the tuning range of the receiver, "Error" appears on the display. If this happens, simply enter a new frequency.

If you make a mistake programming a frequency on a channel, just:

PRESS:	[E] then program correct frequency

DIRECT (MANUAL) CHANNEL ACCESS

To display any channel manually (for example channel 14) when scanning is stopped, just:

PRESS:	[1] [4] [Manual]
READ:	1 4 in second and third spaces followed by the frequency

If you want to advance from channel 14 to 15, just press [Manual] then read 15 followed by the frequency.

SCANNING

To put your receiver in the "Scanning Mode", adjust the squelch properly (see Page 3). Then:

PRESS:	[Scan]
READ:	Rolling Zeros in the 10 right-most spaces of the display.
	The Bank Indicator Dot for the bank being scanned at that instant.
	Lockout symbols (L) (instead of zeros) representing the channels being skipped.

PRIORITY

This selectable feature will permit you to hear channel 1 any time it is active, regardless of any other signals being received at that time. Put your favorite frequency in channel 1. Then:

PRESS:	Priority	"P" is displayed
To de-select Priority		
PRESS:	Priority	again. "P" disappears

LOCKOUT

You may wish to lock out certain frequencies and skip over them when scanning. **To program Lockout** on a channel (for example channel 5) first select that channel manually.

PRESS:	5 Manual	
PRESS:	Lockout	
READ:	5 L	appears in the third and fifth spaces of the display

To remove Lockout

PRESS:	Lockout	again and the "L" will disappear

SPEED

To scan slowly or rapidly (4 or 11 channels per second)

PRESS:	Speed	To resume fast scan PRESS:	Speed

SCAN DELAY

Your scanner may be programmed to pause for about one second after a transmission on any selected channel. This is useful when both sides of a conversation are transmitted on the same frequency.

To program Delay on a selected channel.

PRESS:	Manual	step to that channel
PRESS:	Delay	The symbol "***d***" appears on this channel in the fourth space

To remove Delay

PRESS:	Delay	The symbol "***d***" will disappear from this channel.

SEARCH

To Search for unknown signals between two frequencies in the same band, manually step to the channel you desire to use, (for example Channel 8), then, for example, to Search from 146.500 to 146.950MHz:

PRESS:	[Manual]	step to Channel 8 (or use Direct Access)
PRESS:	[1] [4] [6] [.] [5]	Limit/Hold (for limit)
READ:	8 146.500	(One limit is entered)
PRESS:	[1] [4] [6] [.] [9] [5]	Limit/Hold (for limit)
READ:	146.950	(Other limit is entered)
PRESS:	[Search]	

When an active channel is found, the Search stops and the frequency is displayed.

If you desire to stay on that frequency

PRESS:	[Limit/Hold]	(for hold)

To resume searching without changing Search limits

PRESS:	[Search]	If "Error" appears search limits were not in the same band, or an out of band frequency was attempted.

To enter a frequency found by Searching in that channel

PRESS:	[Enter]	

To continue searching between the same limits, manually select another channel and press [Search] .

Search the Aircraft band (118-136MHz): as above, or

PRESS:	[Aircraft]	The letter "A" will appear in the fifth space.

If searching is stopped by a continuous signal or "image" interference, such as ham repeaters or cab dispatch, press [Aircraft] repeatedly to continue. If interference persists, Search using limits that exclude the interference.

To search the Marine band (156.05-157.48MHz, 160.625-162.025MHz):

PRESS:	[Marine]	The symbol " - " will appear in the fifth space.

EXTERNAL ANTENNA

The telescoping antenna provided with your Bearcat 220 is recommended for most monitoring. For weak-signal reception, or for electrically-noisy locations, the Bearcat A-70 external antenna is readily available. Always use coaxial cable for lead-in. RG-58U is recommended for lengths of up to 100 feet.

Your Bearcat 220 is equipped with an automotive type external antenna jack, and a mating plug (supplied) must be used.

An outside antenna need only be high enough to clear surrounding obstructions. Above all, STAY AWAY FROM POWER LINES! You may be killed upon contact of the antenna with a power line.

EXTERNAL SPEAKER

Although the internal speaker of the scanner will provide ample room volume, in some applications an external speaker such as the Bearcat B-45 may be desired. The external speaker should be plugged into the rear-apron jack which will cut off the internal scanner speaker.

BATTERY

Your scanner is not supplied with a battery. See label on the bottom of your scanner for battery type and installation instructions. It is recommended that you install the proper battery before you start programming and while the set is unplugged. The battery provides power for the channel memory in the event of a power failure or when the power cord is unplugged. While unplugged, the batteries provide power to the channel memory for about one year.

While the receiver is plugged into 117Vac, the battery is not losing its charge and the memory is activated by the power supply.

NOTE: Anytime the BC-220 is turned off or disconnected from its power source, the status of priority, banks and the programmed search limits will be lost; however, delay and lockouts are retained. The radio always turns on scanning in the fast condition showing bank 10.

BATTERY INSTALLATION

The battery compartment is held with two screws. Remove the screws and carefully swing the compartment out of the receiver. Clean the terminals with a pencil eraser, if necessary. Insert the proper batteries into the holder. Reassemble the holder and secure it with the screws. (See picture on the bottom of the receiver).

MOBILE INSTALLATION

In some areas, unauthorized mobile police receivers are unlawful; be sure to check with local authorities before installing your unit.

Your Bearcat 220 may be installed in any vehicle or boat which has a 12-volt, negative-ground electrical system.

A mounting bracket has been provided for your convenience.

1. Using the mobile mounting bracket, select a location under the dash to hold the scanner in the desired position.
2. Mark and drill two mounting holes using a 7/64 drill bit; secure the bracket with two #6 self-tapping screws (provided).
3. Insert the two plastic T-washers (provided) into the bracket holes, flanges inward, and secure the scanner in place with the two mounting bolts and washers (provided).
4. Connect the dc power cable to the insulated terminal on the rear apron of the receiver; attach the other end of the cable to the 12V battery. Be sure the radio cabinet is well-grounded to the car metal through the mounting frame; otherwise, connect a piece of wire from the ground screw on the rear apron of the radio to the metal body of the vehicle.
5. Connect a mobile monitor antenna such as the Bearcat A-60 to the scanner. If necessary, the automotive antenna, extended about 18 inches, can be used with fair results.

USER HINTS

Your scanner is a versatile instrument. The following operating hints will help you use all its features:

1. Always remember when programming, the [E] key must be depressed in order to enter the frequency desired.
2. Never turn the radio OFF by pulling the AC cord from the wall socket. Always turn the ON/OFF volume control OFF first, then disconnect the line cord when you must move the radio.
3. When memory is lost, it is corrected simply by reprogramming the desired frequencies.
4. When searching, a strong signal may cause the scanner to "lock-on" just prior to the actual frequency. (e.g. weather may be received on 162.545 rather than the correct frequency 162.550). This is easily corrected by pressing the Search button again.
5. This receiver has high noise immunity because of the quieting squelch system. However, in cases of strong interfering noise or signals, it may be desirable to reduce the length of the antenna to reduce noise pick-up below a critical level. This may be very effective in medium and strong signal areas.
6. When programming, be sure to press each key firmly in the center — this assures registering each desired number and avoid errors.
7. When moving or shipping the radio, remove the telescoping antenna to avoid damage to it or to the internal circuit assemblies.

SERVICE

If your scanner does not seem to be functioning properly:

1. Refer to operating instructions to confirm that the proper procedure for operation has been followed.
2. Be sure the radio is plugged into a working ac outlet.
3. Is it turned ON?
4. Check that the telescoping antenna is properly installed.
5. If memory is lost after a power failure, check for a dead battery.
6. If "Error" appears on readout, you have entered an invalid frequency.
7. While using the single key-press [Aircraft] search, "image" interference from ham repeaters, cab dispatch, mobile telephone, etc. may stop search. This may be unavoidable in your area and does not indicate failure of the radio.
8. If it is then determined that the receiver requires servicing, refer to the warranty instructions enclosed with your unit for the proper repair facility.
9. When preparing the receiver for shipment, **remove the telescoping antenna, batteries and ac power cord.**
10. Pack the unit in its original packing carton and include a brief, concise description of the observed problem you are having along with your name, address, phone number and a copy of your purchase receipt.

BIRDIES

All scanners using frequency synthesized circuits generate signals called "Birdies". Those signals may interfere with the search frequencies on your scanner. The BC220 is relatively free of this problem.

If during Search the receiver encounters a "birdie", the scan will most likely stop. In order to resume searching just press the Search button.

The following is a list of "birdie" frequencies:

32.55
33.37
38.13

FREQUENCY ALLOCATIONS

Because of the short-range nature of VHF and UHF FM communications, frequencies allocated to services in one geographical location will not be heard more than 25-50 miles distance (an exception is "skip", when signals bounce back to earth from the ionosphere). For this reason, a separate frequency directory must be compiled for each monitoring area.

Most standard frequency separations and classifications are regulated in the United States by the FCC.

Block allocations . . . and even some discrete frequencies . . . covered by your scanner are shown below. These are not necessarily active in your area.

ABBREVIATIONS

Police	P.D.
State Police	St. P.D.
Fire Department	F.D.
Special Emergency	Sp. Emer.
Highway Maintenance	Hwy.
Forestry-Conservation	Fors. Cons.
Government	Govt.
Local Govenrment	L. Govt.
Business Radio	Bus.
Manufacturers	Mfg.
Broadcast Remote	BC R.
Mobile Telephone	Mob. Tel.
Radio Paging	Page.
Special Industrial	Sp. Ind.
Motion Picture	Mot. P.
Power Utilities	Power
Petroleum	Pet.
Forest Products	For. Prod.
Railroad	R.R.
Automobile Emergency	Auto Emer.
Red Cross	
U.S. Weather Bureau	U.S.W.B.
U.S. Coastal & Geodetic Survey	U.S.C.G.S.
National Parks	Nat. Pk.
Indian Affairs	
Bureau of Reclamation	Bur. Recl.
Department of Agriculture & Forestry	Agr. & For.
Land Transportation	Land Tr.

30-50MHz Band

30.01 - 30.56	Govt.
30.56 - 30.62	Sp. Ind.
30.66 - 31.24	Ind. (Pet. For. Cons. Bus., For. Prod.)
31.26 - 31.98	Sp. Ind., For. Cons.
32.00 - 33.00	Govt.
33.02 - 33.16	Hwy., Sp. Emer., Bus.
33.18 - 33.38	Pet.
33.42 - 33.98	F.D.
34.00 - 35.00	Govt.
35.02 - 35.18	Bus.
35.22 - 35.66	Mob. Tel. & Page
35.70 - 35.73	Bus.
35.74 - 35.98	Sp. Ind. & Bus.
36.00 - 37.00	Govt.
37.02 - 37.44	P.D. & L. Govt
37.45 - 37.86	Power
37.90 - 37.98	Hwy. & Sp. Emer
38.00 - 39.00	Govt.
39.02 - 39.98	P.D., L. Govt.
40.00 - 42.00	Govt.
42.02 - 42.94	St. P.D.
42.96 - 43.18	Sp. Ind. & Bus.
43.22 - 43.68	Mob. Tel. Page
43.70 - 44.60	Trucks, Bus.
44.62 - 45.06	St. P.D., For. Cons.
45.08 - 45.66	P.D.
45.68 - 46.04	P.D. Hwy., Sp. Emer.
46.06 - 46.50	F.D.
46.52 - 46.58	L. Govt.
46.60 - 47.00	Govt.
47.02 - 47.40	St. Hwy.
47.42 -	Red Cross
47.44 - 47.68	Sp. Ind., Sp. Emer.
47.70 - 48.54	Power
48.56 - 49.58	For. Prod., Pet.
49.60 - 50.00	Govt.

146 - 174MHz Band

146.000 - 148.000	HAM
148.010 -	MARS
148.15 -	CAP
148.155 - 148.250	MIL
148.290 - 150.750	USN
150.815 - 150.995	Bus.
151.010 - 151.130	Hwy.
151.145 - 151.475	For. Cons.
151.505 - 151.595	Sp. Ind.
151.625 - 151.955	Bus.
151.985 - 152.240	Mob. Tel. (RCC)
152.270 - 152.450	Taxi
152.480 - 152.840	Mob. Tel. Page
152.870 - 153.020	Sp. Ind. Mot. P

153.050 - 153.440 . . Pet., For. Prod.
153.470 - 153.710 . . . . .Power
153.740 - 154.115 . . . . L. Govt.
154.130 - 154.445 . . . . . F.D.
154.450 - 154.600 . Sp. Ind., Pet., Bus.
154.655 - 155.145 . . P.D., L. Govt., St. P.D.
155.160 - 155.400 . . Sp. Emer., P.D.
156.045 - 156.240 . . . P.D., Hwy
156.275 - 157.425 . . . . Marine
157.456 - 157.500 . . . Auto Emer.
157.530 - 157.710 . . . . . Taxi
157.740 - 158.100 . . Mob. Tel., Page
158.130 - 158.460 . Power, For. Prod. Pet.
158.490 - 158.700 . .Mob. Tel. (RCC)
158.730 - 158.970 . . P.D., L. Govt.
158.985 - 159.210 . . . P.D., Hwy
159.225 - 159.465 . . . For. Cons.
159.510 - 160.200 . . . . Trucks
160.215 - 161.565 . . . . . R.R.
161.600 - 162.000 .. . . . Marine
162.026 - 162.175 . . . Bur. Recl.
162.400 - . . . . . U.S.W.B.
162.475 - . . . . . U.S.W.B.
162.550 - . . . . . U.S.W.B.
163.125 - . . . . . Indian Affairs
163.175 - . . . . . Bur. Recl.
163.275 - . . . . . U.S.W.B.
163.388 - 163.538 . . . . . MIL
163.825 - 163.975 . . . . . Govt.
164.025 - 164.075 . . . U.S.C.G.S.
164.175 - 165.188 . . . Bur. Recl., Nat. Pk., Govt., Agr. & For.
169.300 - . . . . . F.A.A.
169.450 - 169.725 . . . Ind., Data
170.150 - . . . . . F.D., BC. R.
170.200 - 170.220 . . . U.S.C.G.S.
170.225 - 170.325 . . Ind., Land Tr.
170.425 - 170.575 . . . For. Cons.
170.975 - 171.250 . Govt. Ind., Land Tr.
171.388 - 172.725 . . . Bur. Recl., For. Cons., Ind., Dept. Ag. & For., Govt.
172.775 - . . . . . Nat. Pk.
173.025 - . . . . . U.S.W.B.
173.075 - . . . . . U.S.C.G.S.
173.204 - . . . Press Relay, Mot. P., Pet., Bur. Recl.

420-512MHz Band

420.000 - 450.000 . . . . . HAM
451.050 - 450.950 . . . Remote Br.
451.000 - 451.150 . . . . . Util.
451.175 - 451.750 . . For. Prod., Pet., Pwr., Tel. Maint.
451.775 - 451.975 . . . Spec. Ind.
452.000 - 452.500 . . . Taxi, Mot. Carrier, R.R.
452.525 - 452.600 . . . Auto Club
452.625 - 452.975 Motor Carr., R.R
453.000 - 453.975 . . L. Govt., P.D., F.D.
454.000 - 454.975
454.000 - 454.975 . . . Mob. Tel.
455.000 - 455.975 . . . Remote Br.
456.000 - 458.975 . . . P.D., F.D., Ind., LandTr.
459.000 - 459.975 . .Domestic Public
460.000 - 460.625 . . . P.D., F.D.
460.650 - 462.175 . . . . . Bus.
462.000 - 462.450 . . . . . Taxi
462.550 - 462.725 . . . . . C.B.
462.750 - 462.975 . . . . . Bus.
463.000 - 463.175 . . . . . Med.
463.200 - 464.975 . . . . . Bus.
465.000 - 467.500 . . . P.D., F.D., Ind., Lan. Tr.
467.750 - 467.925 . . . . . Bus.
467.5375 - 467.7375 . . . . C.B.
467.7375 - 469.975 . . . Pub. Safety, Ind., Land. Tr.

In some large metropolitan areas, 1 or 2 channels of the "TV Band" (470MHz to 512MHz) are used for communication purposes. Each T.V. station (channels 14 through 20) utilizes 6MHz:

470-476 T.V.	Channel 14
476-482 T.V.	Chanenl 15
482-488 T.V.	Channel 16
488-494 T.V.	Channel 17
494-500 T.V.	Channel 18
500-506 T.V.	Channel 19
506-512 T.V.	Channel 20

Where these frequencies are assigned for communication purposes, in lieu of a T.V. station, the 6MHz segment is allocated as shown here for channel 14 (470 476MHz0).

470.0125 - 470.2875 .Domestic Public (Base, Mob.)
470.3125 - 471.1375 . .Public Safety
471.1625 - 471.2875 . . . Reserve Pool A
471.3125 - 471.4125 . . .Pwr., Tel. Maint.
471.4375 - 471.6375 . . Spec. Ind.
471.6625 - 471.7875 . . Reserve Pool B
471.8125 - 472.3375 . . . . Bus.
472.3625 - 472.4375 . . . . Taxi
472.4675 - 472.7875 . . R.R., Motor Carrier, Auto Emer.
472.8125 - 472.987 . Pet., For. Prod., Mfg
473.0125 - 473.2875 .Domestic Public
473.3125 - 474.1375 . .Public Safety
474.1625 - 474.2875 . . . Reserve Pool A
474.3125 - 474.4125 . . Pwr., Tel. Maint.
474.4375 - 474.6375 . . Spec. Ind. (Mobile)
474.6625 - 474.7875 . . . Reserve Pool B
474.8125 - 475.3375 . . . . Bus.
475.3625 - 475.4375 . . . . Taxi
475.4625 - 475,7875 . R.R., Motor Carrier, Auto Emer.
475.8125 - 475.9875 .Pet., For. Prod., Mfg.

The same allocation pattern is repeated for each of the TV channels 14 thru 20. For example, if channel 17 is assigned for communications in your area, "Taxi" would be 490.3625 to 490.4375 and 493.4375 (corresponding to 472.3625 to 472.4375 and 475.3625 to 475.4375 above). Note that in the example, we added three TV channels (18MHz to the channel 14 frequencies.

NUMERICAL LISTING OF VHF MARINE RADIOTELEPHONE CHANNELS

CHANNEL	XMIT FREQUENCY (MHz) SHIP	COAST	AUTHORIZED TRAFFIC
1	156.050	160.650	International Only
2	156.100	160.700	International Only
3	156.150	160.750	International Only
4	156.200	160.800	International Only
5	156.250	160.850	International Only
6	156.300		INTERSHIP SAFETY
7	156.350	160.950	International Only
7A	156.350	156.350	Commercial
8	156.400	———	Commercial
9	156.450	156.450	Commercial, Non-Commercial
10	156.500	156.500	Commercial
11	156.550	156.550	Commercial
12	156.600	156.600	Port Operations, USCG
13	156.650	156.650	Canals, Locks, Pilots
14	156.700	156.700	Port Operations, USCG
15	———	156.750	Environmental, Hydrographic
16	156.800	156.800	DISTRESS, SAFETY, & CALLING
17	156.850	156.850	Restricted, State Control
18	156.900	161.500	International Only
18A	156.900	156.900	Commercial
19	156.950	161.550	International Only
19A	156.950	156.950	Commercial
20	157.000	161.600	Port Operations
21	157.050	161.650	International Only
21CG	157.050	157.050	Restricted, USCG
22	157.100	161.700	International Only
22CG	157.100	157.100	Restricted, USCG
23	157.150	161.750	International Only
23CG	157.150	157.150	Restricted, USCG
24	157.200	161.800	Public Correspondence
25	157.250	161.850	Public Correspondence
26	157.300	161.900	Public Correspondence
27	157.350	161.950	Public Correspondence
28	157.400	162.000	Public Correspondence
29	157.450	157.450	International Only
60	156.025	160.625	International Only
61	156.075	160.675	International Only
62	156.125	160.725	International Only
63	156.175	160.775	International Only
64	156.225	160.825	International Only
65	156.275	160.875	International Only
65A	156.275	156.275	Port Operations
66	156.325	160.925	International Only
66A	156.325	156.325	Port Operations
67	156.375	———	Commercial
68	156.425	156.425	Non Commercial
69	156.475	156.475	Non Commercial
70	156.525	———	Non Commercial
71	156.575	156.575	Non Commercial
72	156.625	———	Non Commercial
73	156.675	156.675	Port Operations
74	156.725	156.725	Port Operations
75	———	———	GUARD CHANNEL, Unuseable
76	———	———	GUARD CHANNEL, Unuseable
77	156.875	———	Commercial
78	156.925	161.525	International Only
78A	156.925	156.925	Non-Commercial
79	156.975	161.575	International Only
79A	156.975	156.975	Commercial
80	157.025	161.625	International Only
80A	157.025	157.025	Commercial
81	157.075	161.675	International Only
82	157.125	161.725	International Only
83	157.175	161.775	International Only
83CG	157.175	157.175	USCG Auxillary Only
84	157.225	161.825	Public Correspondence
85	157.275	161.875	Public Correspondence
86	157.325	161.925	Public Correspondence
87	157.375	161.975	Public Correspondence
88	157.425	162.025	International Only
89	157.475	157.475	Commercial

AIRCRAFT FREQUENCIES

118.00 to 128.8	Air Traffic Control, at the field and up to 30 miles from major airports and includes: Approach Control Departure Control Center Tower (ATIS) Automatic Terminal Information Service Clearance Delivery (majority of communications below 125.00)

SPECIFIC FREQUENCIES WITHIN THE 118-135.975 RANGE:

121.5	National Aircraft Emergency
121.6 to 121.9	Ground Control of aircraft at major airports
121.975-122.675	General aviation aeronautical advisory stations and Air Traffic Control. Commonly called Flight Service Station (FSS)
122.0	Weather Advisory
123.6	FSS at airport with a tower
122.7 to 123.05	Unicom-Communications at General Aviation airports
122.90, 122.95	Air to Air Communications
123.1	Search and Rescue
123.175-123.575	Flight test.—manufacturers, etc.
123.3-123.5	Flight schools-instruction
126.2	Military Towers
128.825-132.00	Aeronautical Enroute Frequencies Airlines communication with their companies
132.025-135.975	Air Traffic Control beyond 30 miles of major airport. Usually remote stations.

NOTE: Authorization and channels used may vary with locality. Check with local authorities for verification.

LIMITED WARRANTY

This Bearcat® receiver is warranted to the original consumer purchaser to be free from defects in material and workmanship for a period of one (1) year from the date of purchase as shown on purchaser's receipt.

Electra will repair or replace, AT ITS OPTION AND FREE OF CHARGE, during the warranty period, any part which proves defective in material or workmanship under normal installation, use, and service, provided the receiver is returned to our factory (address below) or to one of our authorized Service Centers (list enclosed), TRANSPORTATION CHARGES PREPAID. Receivers returned to our factory or authorized Service Center must be accompanied by a copy of the purchase receipt. In the absence of such purchase receipt, the warranty period shall be one (1) year from the date of manufacture as indicated by the serial number on your unit.

Any damage to this receiver as a result of misuse, abuse, neglect, accident, improper installation, destruction or alteration of the serial number, repair or alteration outside our factory or Service Center, or any use violative of instructions furnished by us WILL VOID THE WARRANTY. THIS WARRANTY IS LIMITED TO DEFECTIVE PARTS REPAIR AND/OR REPLACEMENT ONLY AND EXCLUDES ANY INCIDENTAL AND CONSEQUENTIAL DAMAGES CONNECTED THEREWITH.

Some states do not allow the exclusion of limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. In the event of a problem with warranty service or performance, you may be able to go to a small claims court, or a federal district court.

ELECTRA COMPANY
Division of Masco Corporation of Indiana
300 South on East County Line Road
Cumberland, Indiana 46229